12-3-74

Environmental Chemistry Review of picloram,
4-amino-3,5,6-trichloropicolinic acid (Tordon)

Reg No. 464-320 and 464-323
Dow Chemical Co.
12/3/74

I. Introduction:

A. This is an additional review for Tordon 10K on rangeland and pastures in certain states

B. This has been previously reviewed on 11/15/74, 11/21/74, 11/29/74, 12/6/74 and 12/9/74 previous reviews of the chemical picloram have been made for #464-407 (11/15/73) and 4F1489 (5/17/74).

II. Comments:

A. We have intensively reviewed the large packages of data submitted by Dow (more then 100 references submitted for the most recent petition applicable to both Tordon 22K and Tordon 10K). Details of many of the reports and some conclusions derived therefrom are found in the above reviews and comments. The following deal with conclusions based on some additional data received or reviewed since the last set of comments and well as data previously discussed in those comments. Details of reports can be found in these reviews:

1. Picloram degradation: Data submitted to date fail to demonstrate predictable rates of degradation for the States added to the label which are located east of the Mississippi. Some considerations of the original methods for predicting loss rates suggest they may not be good predictors in other locales, but there are experimental data in these other places which permit the prediction of loss rates in those areas. See review of 12/3/74 for further discussion details.

2. Picloram photodegradation: Photodegradation in aqueous solution does take place. Half-lives of less then 20 days are found only with exposure to direct California summer sun. Other studies where sunlight and deep containers were used show half-lives greater than 12 to 40 days. See previous reviews for details. (See also References 1a and Tabs. 34 and 85 of the Tordon 22K environmental package).

3. Picloram mobility: Picloram leaches readily and potential phytotoxic amounts have been found in runoff water immediately after and up to 100 days after application of up to 2 lb/acre

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active near the site (within 10 meters). Phytotoxic amounts were also found in one study (1a) as far as 1000 meters from the site after the first rainfall following applications. Absolute values of picloram in runoff water are less than comparable applications of 2,4-D or related compounds, but lower concentrations of picloram are apparently needed to cause phytotoxicity than are needed for 2,4-D.

4. Picloram partioning: Picloram was stated to partition preferentially in water over soil, (indicated by reference in 12/3/74 submission) but examination of thereferenced report and additional data in Ref (1a) among others, indicated a favoring of organic matter over either water or other soil components except possible iron and aluminum ions.

III. Conclusions:

The evidence submitted suggests then microbial or chemical degradation cannot account for the rate of dissipation found in the only extensive dissipation studies performed within the expanded use area east of the Mississippi. An explanation may be that dissipation is correlated to mobilization in these wetter locales. Potential problems associated with picloram in the southeast are these different that those in the west where long persistence is common. In the east, questions arise concerning impacts of extensive leaching and runoff expecially when applications are to sloping lands or permeable soils with near surface ground water or permeable substrate rock. Unlike other mobile pesticides, the effects of mobility on non-targets species or areas may not be alleviated by rapid or moderately rapid degradation in water. The possibility exits of sequestering in organic bottom sediments where photodegradations and biochemical degradation of this chemical may thus result in an accumulations of the pesticide in certain ecosystems. The data supplied is insufficient to permit a determinations of the fate of this chemical once it leaves the site of application.

Non-target phytotoxicity near but not within the application areas has been reported, but these reports indicate ingrequent accidents, generally as a result of runoff. The low frequency of reports may be due to a low frequency of accidents or to a use pattern where crop lands are not generally involved and where losses may not be easily reported.

IV. Recommendations:

A. Object to registration

B. The following studies are needed to support registration

Pg. 3 # The following studies are needed to support registration

1. An hydrolysis study. See enclosure.
   (Please enclose p V33 2nd Draft Guidelines)

2. A catfish accumulation study. See enclousre.

3. Persistence studies in southeastern U.S. See enclousre.
   (Please enclose Guidelines pp V-16 to V22 and V24-V28)

4. A soil-water partion study. This study should incorporate use of radiolabelled picloram in a closed system with water and lake or pond bottom sediment. The system should be designed so that $^{14}CO_2$ is trapped and a materila balance is maintained. The systems should be replicated so that sunlight exposed and dark conditions may be studied for possible effects of photodegradation. The containers should be several feet deep to simulate pond conditions and artifical circulation of water should be limited if at all. The object of the study should be to determine sediment-water partion coefficients and observe if accumulation can occur in sediments from continuous exposure over a long term. Modifications of protocols for a similar program reported in J. Ag. Food Chem. 15:148, 1967 may be appropriate.

5. A monitoring program should be established which permits field observations of leaching, runoff, concentrations in stream and pond water and sediments, aquatic animals and non-target phytotoxicity.

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NOTE: Dow has been told of these data requirements and an experimental permit is going to be submitted to obtain data in West Virginia.

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